GRACE EASY

Manual

Version 01/2013

GRACE EASY

These operating instructions are valid for the GRACE EASY Pedelec- and S-Pedelec versions in the supplied frame sizes M and L in the 2013 model year.

GRACE EASY operating instructions

GRACE

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I. Appendices

No.	Name
A	Service manual

Explanations of symbols

To begin with, we would like to acquaint you with the meaning of the attention and hazard symbols which you can find in these operating instructions.

It is very important that you follow the information by the symbols.

Caution!

This caution symbol points out a potentially hazardous situation through which persons in the environment may sustain injury, or the product or objects may be damaged.

Danger!

Denotes an immediate danger through explosion, for instance by improper handling of the battery and charger.

Information!

This sign has useful information about how to handle your product.

Note!

This symbol points out that damage is possible on the vehicle.

Read the original operating manual!

This symbol refers to important information in the original operating instructions of the component manufacturers.

Your GRACE EASY

The GRACE EASY is a member of the class of electric power-assisted motorcycles, also known as EPAC's. The motor only provides assistance when you apply force to the pedals.

The force applied by the rider is measured in terms of speed, pedalling frequency, and torque through which the motorised assistance is adjusted. The maximum assisted speed is 25 km/h (15.5 mph) or 32 km/h (20 mph) in the USA as a Pedelec, or 41 km/h (25.5 mph) as an S-Pedelec. The electric motor switches off once this speed is reached. However, you are also free to travel faster than the maximum assisted speed with your own pedal power and without support from the electric motor.

1.1 About this operating manual

This operating manual is solely for the GRACE EASY range in the Pedelec- and S-Pedelec variants and frame sizes **M** and **L** for model year 2013. Follow the instructions and warnings for your own safety. Failing to do so may damage the bike and/or lead to personal injury,

For maintenance work and repairs, please talk directly to your dealer.

Also observe the important information in the original operating instructions of the component manufacturers available online:

Avid	www.sram.com/de/avid
BionX	www.bionxinternational.com
Busch + Müller	www.bumm.de
Cane Creek	www.canecreek.com
Continental	www.conti-online.com
Gates Carbon Drive	www.carbondrivesystems.com
Magura	www.magura.com
SRAM	www.sram.com
SR Suntour	www.srsuntour-cycling.com

1.2. Scope of supply

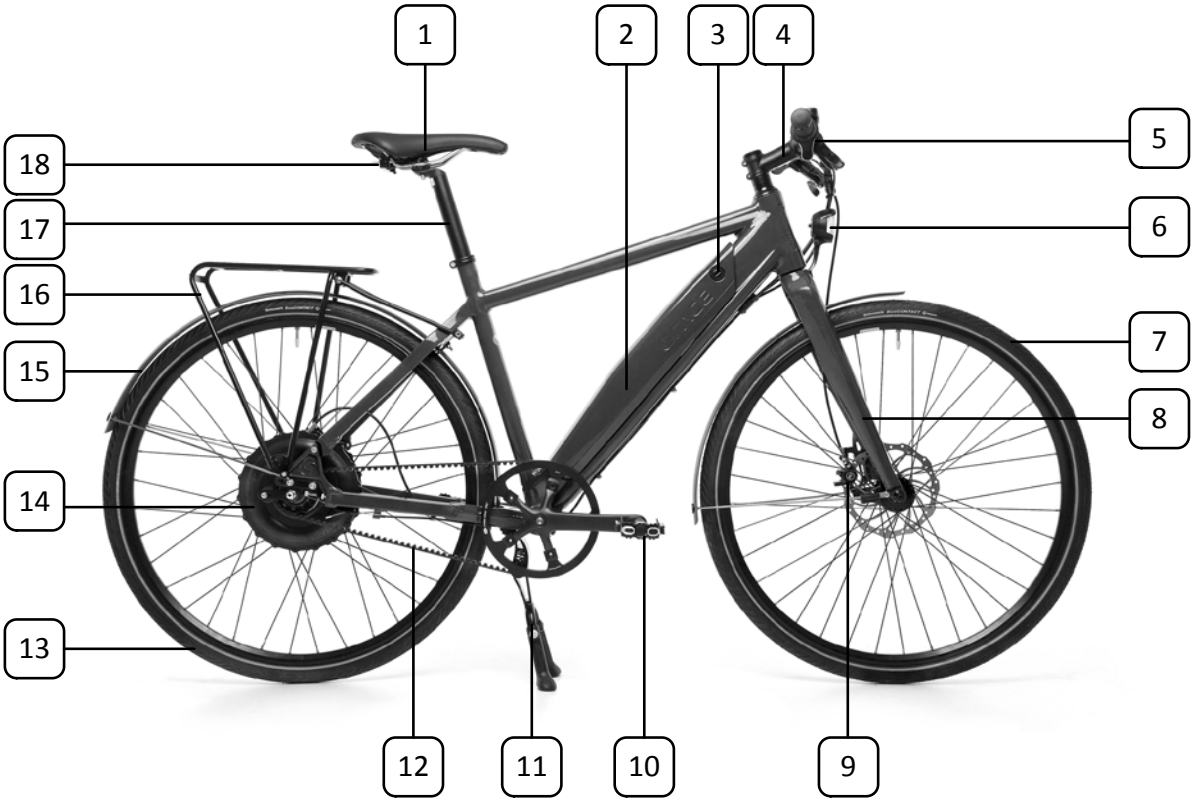
Included in the GRACE EASY scope of supply:

- BionX standard battery charger
- Transport safety mechanisms (2 pieces) for the braking system
- Keys (2 pieces) for securing the battery pack
- GRACE EASY manual
- GRACE EASY service manual
- Reflectors (2 pieces, S-Pedelec only)
- Rear-view mirror (S-Pedelec only)

The following components in the scope of supply do not come pre-assembled by default: However, they can also be mounted to the vehicle by request. Please contact your GRACE dealer for more information.

- Mudguard: Curana C-Lite 28'' x 40 mm
- Luggage rack: Tubus Vega
- Fork: Rock Shox Recon 29''

1.3. Description of equipment on the GRACE EASY



1. Saddle
2. Battery
3. Battery lock
4. Stem
5. Twist shifter
6. Headlight
7. Front wheel
8. Fork/spring fork*
9. Hydraulic disc brake
10. Crank and pedal
11. Double kick stand
12. Carbon belt
13. Rear wheel
14. Motor
15. Mudguard*
16. Luggage rack*
17. Saddle post
18. Rear light

*optional accessory

1.4 Use of the vehicle as intended

Please pay attention to the following data when using the vehicle:

- the safety-related advice in this operating manual
- the "Technical data" chapter in this operating manual
- the country-specific road traffic regulations (in Germany this is the German Road Traffic Regulations, StVO)
- country-specific regulations for vehicle registrations (in Germany this is the German Traffic Registration Regulations, StVZO)

The design and equipment on the GRACE EASY mean it is designed for use on tarmacked roads and maintained forest and dirt tracks. The tyres must not leave the ground. The GRACE EASY is not designed for riding over obstacles such as high curbs. It is also not designed for transporting more than one person. The active and passive lighting equipment required under technical safety regulations in Germany are installed in compliance with the StVZO.

This technical safety equipment must be inspected regularly and when needed must be repaired by a technician.

The total weight comprising the GRACE EASY incl. rider, accessories and luggage must not exceed the maximum permissible weight of 120 kg (256 lbs).

The GRACE EASY is not intended for persons with impaired physical, sensory or intellectual capabilities. GRACE EASY is also not suitable for children under 14 years.

GRACE EASY is not suitable for competitions.

Riding the GRACE EASY as an S-Pedelec with a bike trailer is not permitted.

Bear in mind that other road users may not be able to judge the high speeds you are riding at.

Modifications to your GRACE EASY which result in an increase in the motor output and speed put your safety while riding at risk and can lead to your driver's licence being revoked or the loss of insurance coverage.

The assembly of the following components is mandatory for the S-Pedelecs to make the vehicle roadworthy according to the German StVZO:

- Reflectors (2 pieces)
- Rear-view mirror

A helmet must be worn at all times when riding the S-Pedelecs, and the bike must have an insurance plate. You must have an M-category driver's licence and must carry your licence with you at all times.

Neither manufacturer nor dealer assume any liability for any damage resulting from use beyond what is specified in this operating manual or from non-compliance with technical safety instructions.

Before joining the main roads, first practice on your new GRACE EASY in an area with little traffic.

You may be legally required to wear a helmet for Pedelecs depending on which country you are using your GRACE EASY. We recommend for your own safety that you always wear a suitable helmet and goggles regardless of whether it is required or not.

Wear bright and noticeable clothing suitable for riding and shoes which are appropriate for the pedals. When riding in traffic, always be considerate and pay attention to the traffic rules so as not to put yourself or others in danger.

Please follow the technical data at the end of this operating manual.

2. First time use

2.1. Removing/inserting the battery

Removing the battery:

Using the key, unlock the lock on the battery so that the lock cylinder comes out.

Slide the battery along the down tube towards the handlebars. Lift up the rear of the battery and carefully remove it by moving it at a diagonal towards the rear.

Inserting the battery:

Set the battery down onto the down tube. Slide the battery along the down tube towards the bottom bracket.

Press the battery lock cylinder inside it until it clicks into place.

If the lock cylinder of the battery does not latch into place, this means the battery is not secured. It will be able to fall out of the battery cradle while riding. Risk of accident!

Always install the battery as described and make sure that the battery is latched into place.

If the battery is not correctly fitted in the guide rails, it is not possible to press in the lock cylinder. If this is the case, re-insert the battery.

The lock cylinder can also be pressed in even if the key is not inserted into the lock.

2.2. Charging the battery

The battery is charged at high voltage. If the mains cable or socket is damaged, wet or dirty, you may get an electric shock from it. Danger of death!

- Only use the supplied battery charger.
- Do not use the battery charger when wet.
- Do not use the mains cable or charger if damaged. Replace damaged mains cable or charger immediately.
- Before connecting the charger cable, remove any foreign matter from the charging socket, e.g. dirt, ice or snow.
- Do not use the charger in damp rooms or if the ambient temperature falls outside of the permissible operating temperature of -10°C (14°F) to 40°C (104°F).
- Only use the battery for the GRACE EASY.
- Do not submerge the battery under water.
- Keep the battery away from infants.

The battery heats up when charging!

- Only charge the battery in locations without any combustible materials in the proximity.
- During charging, place the charger and battery on a non-combustible surface.
- If you choose to charge the battery while fitted to the bike, place the bike somewhere where a potential fire is not able to spread.
- Do not charge the battery on carpeted floors.
- Do not cover up the battery and battery charger during charging.

Using a charger different to the one supplied can cause the battery to overheat. Risk of explosion!

To charge the battery only use the charger supplied.

Fully discharging the battery can lead to an internal short circuit. The battery will heat up considerably. Fire hazard!

- Avoid fully discharging the battery both during operation and storage.
- Do not ride the bike with a fully discharged battery.
- Do not expose the battery to temperatures beyond the permissible storage temperatures of -10°C (14°F) to 45°C (113°F). Note that temperatures of 45°C (113°F) can arise in the proximity of heaters, in direct sunlight, or in overheated interiors of motor vehicles.
- Do not submerge the battery in water.
- The battery and battery charger are maintenance-free. Do not attempt to dismantle or modify the battery or battery charger. Do not expose the battery to excessive pressure. Note that a higher pressure can also result as a result of heavy objects being placed on it. Do not use a battery if the housing is damaged.
- If during use, charging or storage, you notice that the battery is hot, has a strong odour, or has changed in appearance or responds abnormally in any other way, stop using it.

Fully discharging the battery leads to irreversible damage and a loss of capacity. When not using the battery for a longer period of time, fully charge it regularly, after every 6 months at the latest.

The supplied charger is suitable for a voltage range of 100 - 240 V. It is not necessary to switch the charger to the required voltage - the power supply will detect it automatically.

The battery is fitted to the down tube of your GRACE EASY. You can charge the battery while it is fitted to the bike or remove it from the mounting before doing so.

The charger does not have an On/Off switch. When not needing the charger, remove the mains plug to conserve energy.

The battery can be charged at any time without affecting its service life. Interrupting the charging does not damage the battery.

Connect the plug on the charging cable to the socket on the battery.

Next, connect the charger to the mains with the mains plug.

The LED ring on the battery socket briefly lights up red before switching to orange. When properly connected, an acoustic signal will sound. The battery is charging.

After the battery has been fully charged, the charging will stop automatically. Disconnect the charger from the mains and the battery from the charger. The battery is switched off automatically.

It takes about 5 hours for the battery to fully charge. When charging is complete, the LED ring will go from orange to green. Unplug the plug on the charger from the battery followed by the mains plug from the socket.

- Ideally, charge the battery at a room temperature of 20°C (68°F). Before charging, give the battery enough time to reach this temperature itself.
- Avoid fully charging the battery too frequently. The battery prefers to be partially discharged. There is no memory effect in Lithium-ion batteries.
- Quick discharges followed by charging can cause the charge indicator to no longer correspond to the battery's charge state. For this reason, after around 30 charges, fully discharge the battery and charge it up again afterwards. This does the required calibration of charge indicator with charge state.

All Lithium-ion batteries are subject to function-related wear. Normal use and the ageing process causes the battery cells to oxidate. The battery loses capacity. The typical life expectancy of a Lithium-ion battery is currently 2 to 3 years, regardless of whether the battery is in use or not.

The battery goes into protection mode when the GRACE EASY is not used for two months at a time or when the battery charge was used up and was not re-charged in the week that followed.

The battery is inactive in protection mode. The only way to re-activate the battery is through a full charging cycle.

When the battery is in protection mode, the lights do not work. Driving the bike without working lights may be prohibited in some countries.

2.3. Adjusting the saddle

To adjust the height of the saddle, undo the SW4 hexagon socket in the clamp on the saddle post.

Adjust the height of the seat to your height by placing your heel on the pedal when the crank is at the lowest point. Your leg should be almost fully extended.

If you pull out the seat post too far, the seat tube may no longer be able to support the seat post sufficiently. The seat post may come undone while riding or it may damage or break off the seat tube. Danger of injury or accident!

Do not extend the seat post further than the minimum depth mark of 10 cm (3.94 in).

There is a risk that the cable for the rear light is damaged when removing the seat post. Therefore, remove the saddle post slowly and undo the connectors between the seat post and seat tube once it becomes visible.

Tighten the screw on the saddle post clamp (see torque table).

2.4. Adjusting the saddle position and -angle

To change the angle and horizontal position of the saddle, undo the two hexagon sockets on the saddle clamp which are positioned immediately behind the saddle post above the rear wheel.

You can now move the saddle forwards and backwards in the guide and adjust the angle.

In the basic position, the saddle should be arranged horizontally. You may not be able to find the best position until after a long ride.

Afterwards, retighten both screws again (see torque table).

If you place the balls of your feet on the pedal while it is in its lowest position, you knee should be bent slightly and your kneecap should be in a vertical line to the pedal axis.

2.5. Adjusting the position of the brake lever

Undo the screws on the handlebar clamp with a Torx T25 spanner to twist and move the brake levers on the handlebars. First tighten the top screw until the brake lever and clamp are adjacent to each other without a gap. Then tighten the bottom screw (see torque table).

The brake levers are configured correctly when your fingers can reach the brake levers when your arms are outstretched. The wrist should be stretched out as much as possible.

2.6. Adjusting the width of the brake lever

The brake lever grip can be adjusted to the size of your hand with the aid of a Torx T25 key. Adjust the brake lever so that you can grab it quickly and safely while applying a large handforce. The brake lever must not come into contact with the handlebars.

If you can pull the brake lever as far as the handlebars, you cannot apply the full braking force during a full braking. This increases the braking distance. Risk of accident!

2.7. Assembling the side reflectors (S-Pedelec only)

The self-adhering side reflectors are fixed to the down tube of the frame on the side.

2.8. Rear-view mirror (S-Pedelec only)

Fix the rear-view mirror to the left side of the handlebars with a hexagon socket SW4 (0.16 in) without play.

In the image, the mirror attachment is shown for driving on the right-hand side. The mirror must be attached to the right hand side for driving on the left-hand side.

2.9. Insurance plate (S-Pedelec only)

The insurance plate is fixed to the number plate holder beneath the saddle with two screws (M4x10) and two self-sealing nuts.

3. Before each ride

3.1. Checking the wheels and tyres

Observe the tyre pressure information provided by the manufacturer which is printed on the tyre wall!

Exceeding the maximum permissible air pressure when pumping up the tyres can cause the tyre to puncture!

Valves which are not fitted straight can break off while riding. The tyres will rapidly lose pressure leading to unstable riding response. Risk of accident!

Before each ride, check the valve fittings and adjust where necessary. The valves must extend beyond the rims at a right angle.

GRACE EASY S-Pedelec: Using different tyres on the S-Pedelec which do not comply with the type-approved tyres according to ECE-R75 and size 42-622, B20 leads to the loss of the bike's registration. Different tyres must be added to the registration document for vehicles of this class.

When wanting to use a different model of tyre than the Continental EcoContact on your GRACE EASY, also make sure that it has reflective strips on the sides of the tyres as well. Alternatively, in Germany, you can attach two spoke reflectors per wheel as per the German Traffic Registration Regulations (StVZO). Pay attention to the regulations in your country.

Before each ride

- check the tyres and wheels for damage and any lodged foreign matter Damaged wheels can lead to a loss of tyre pressure and other damage.
- the tread depth of the tyres.
- the concentricity of the wheels by allowing both wheels to spin freely. Poor concentricity may be caused by damaged tyres, broken axles or broken spokes. Explore the origin of any rattling noises and where necessary check the bearings and screw connections.

3.2. Checking the battery fitting

Before each ride, check that the battery lock cylinder is latched into position. If the battery is not locked into place via the lock, it could dislodge during the ride and fall off.

3.3. Checking the drive belt

Inadequately secured sprockets and guides may dislodge during the ride. Incorrectly adjusted drive belts may drift out of the sprockets while riding the bike. Risk of accident and injury!

Always follow all instructions concerning how to work with drive belts, especially when installing or removing the rear wheel. Extra care is needed to prevent damage to the drive belt.

Before each ride, check

- whether the drive belt is properly aligned and taught and the sprockets are firmly screwed on.
- that the belt guide is correctly installed to prevent the drive belt from skipping and leaving the rear sprocket.

3.4. Checking the function and wear of the brake system

On disc brakes, the pressure point must be stable. When the pressure point is not reached after two thirds of the way, pull the lever several times ("pumps") until the linings rest against the disk. When the pressure point wanders during the ride, the braking system must vented in a specialist workshop.

Before each ride, carry out a brake check while the bike is stationary. To do so, pull the braking lever towards the handlebars with two fingers and normal braking force. The brake lever must not touch the handlebar grip.

Brake discs, brake callipers, and quick-release clamps and axle nuts can become very hot after braking, especially on longer rides. Danger of injury!

Check the braking discs:

- You should not be able to see any grooves or brake-outs with the naked eye. The friction surface must be free of oil and dirt.
- All screws must pre present and have a firm fit.

Check the brake callipers for oil leaks. Make sure the brake cables are kink-free. Check the seal on the brake cables.

Pressure point: Each brake has a certain amount of idle motion at the brake lever. When this idle motion is overcome with a small amount of handforce the brake will apply, the pressure point is reached. If the brake is properly adjusted and vented, applying a greater handforce will result in a higher braking performance while moving the brake lever a shorter distance.

Brake pads and discs wear due to friction. The more often you ride in a hilly environment or through rain or dirt, the higher the wear.

The braking system on the GRACE EASY has a fully-automatic pad synchronisation system. This system balances the wear on the brake pads so that the pressure point of the brake is always constant.

The wear condition of the brake pads can be checked with the transport securing mechanism. The pads are worn and must be replaced when the thick end of the transport securing mechanism no longer fits between the lugs on the brake pads while the brake is applied.

New brake pads must be run in until they reach their optimal braking performance. Accelerate the bike approx. 30-50 times to around 30 km/h (19 mph) and brake until the bike comes to a stop. If the necessary handforce stops falling to brake, the run-in procedure is closed.

3.5. Checking the suspension forks (optional accessory)

Before each ride, clean dirt and contaminants on the upper tubes and check them for scratches.

Lubricate the seals and tubes before each ride.

3.6. Checking the screw connections

Before each ride, check whether the following screw connections are tightened firmly:

- Securing the front wheel
- Securing the rear wheel
- Securing the grips and brake levers. It must not be possible to twist them.
- Securing saddle and saddle post

4. Function description

4.1. BionX drive

The drive system has three sensors (speed, pedal frequency and torque applied by the driver) in order to optimally support the current driving situation.

The sensor for measuring the pedal power can lose its electronic adjustment. This can lead to a malfunction of the pedal power support. Keep magnets and large metallic objects away from the pedal bearings, such as hammers.

4.2. Removing/installing the display unit

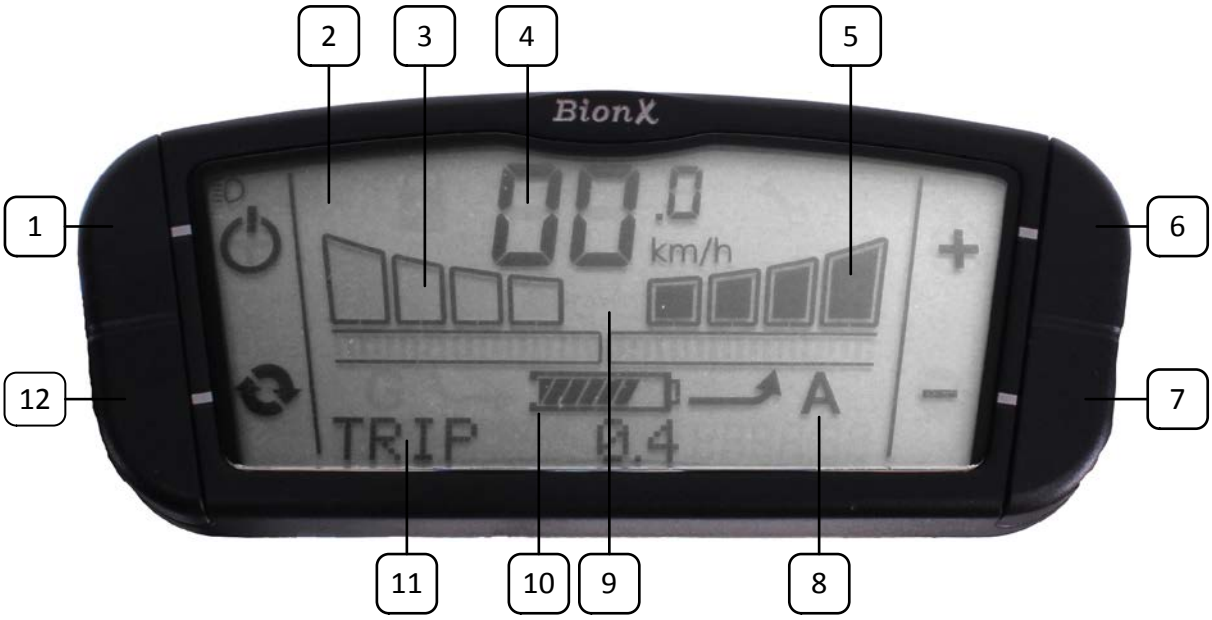
To remove the display unit, press the securing mechanism beneath the carrier and slide the display unit downwards.

To insert, slide the display unit into the carrier until the securing mechanism slides into place and you can hear a click.

4.3. Display unit

The display unit can be used to change the system settings. The display provides you with information about: Drive/generator level, speed, ride time and distance.

Only operate the display unit when the traffic situation permits it. While you are operating the display unit during the ride you are distracted from what is going on around you. Risk of accident.



1	⏻ - button: Switch the system on/off, switching lights on/off
2	Display
3	Bar indicator: Generator level
4	Tachometer
5	Bar indicator: Drive level
6	+ - button: Increase values
7	— - button: Reduce values
8	Display: Drive- (A) / generator level (G)
9	Display: Bike mode
10	Display: Battery charge status
11	On-board computer: Trip mileage, overall mileage, ride time, average speed, motor temperature, and clock
12	⟳ - button: Set the clock, scroll through/reset display

4.4. Switch the drive system on/off

Briefly press on one of the two top buttons. Activation is acknowledged by the system with an acoustic signal. A self-test is conducted which ends with a count down on the tachometer.

The drive system is activated as soon as you press down on the pedals. The level of assistance provided is based on the settings in the on-board computer. Once you stop pressing down on the pedals while riding, or once you have reached the maximum assisted speed, the drive system will de-activate assistance mode.

Assistance mode is automatically re-activated once the speed falls below the maximum assisted speed and you apply force to the pedals.

The drive system can be switched off by pressing the - ⏻ button briefly - this is also acknowledged with an acoustic signal.

The electronic components are integrated via interfaces. Interfering with electronic components or software improperly may under certain circumstances cause faults in systems which were not modified. These kinds of functional faults can put the operational reliability of your GRACE EASY at risk and thus put your own safety at considerable risk. For this reason, always have a qualified workshop carry out all work and modifications on electronic components.

4.5. Choose an assistance level

The GRACE EASY only provides assistance when you apply force to the pedals. Once you stop applying force, the electric motor switches off. The pedal power assistance will also switch off if you exceed the maximum assisted speed.

If pedal power assistance is switched on when riding over a smooth or slippery road surface, the rear wheel may spin or slip when accelerating. Risk of accident!

Always switch off pedal power assistance on smooth or slippery road surfaces.

The assistance level allows you to select the output the electric drive should provide to assist your pedal power. The higher the assistance level, the less force you need to exert to maintain a specific speed. You can choose between four assistance levels.

Press the + button to move up an assistance level.

An “A” appears in the display. The bar display shows the selected assistance level. if you previously set a generator level, you will first need to reduce the generator level using the + button.

Press the — button to reduce the assistance level.

Assistance level	**Driving situation**
none	Driving without electrical pedal power assistance
1	Driving on flat land
2	Driving up hills, against the wind
3	Driving up steep hills, against a strong wind
4	Driving up very steep hills

4.6. Select the generator level

When the generator mode is switched on, or when braking with the front brake, the rear wheel is braked by the electric motor. The rear wheel may jam or slip on smooth or slippery road surfaces. Risk of accident!

Always switch off generator mode on smooth or slippery road surfaces and use the rear brake to brake wherever possible.

The generator level allows you to choose how strongly the vehicle is to be braked by the electric motor in generator mode. The generator level also determines the extent to which the battery is charged when braking. You can choose between four different generator levels.

If you previously adjusted the generator level, the bike continues to brake until you switch off the generator mode again.

If you brake using the front wheel brake, the electric motor always applies the brakes to the rear wheel at the same time, even when the generator mode is switched off. The size of the braking force applied to the rear wheel depends on the speed and cannot be proportioned. Exception: The rear wheel does not brake when the battery is fully charged.

Press the — button to increase the generator level.

A “G” appears in the display. The bar indicator shows the currently selected generator level. If you previously adjusted a drive level, you will first need to reduce the drive level with the — button.

Press the + button to reduce the generator level.

Generator level (G)	Driving situation
none	No braking effect, no energy recuperation
1	Driving up slight inclines, tail wind
2	Driving up inclines, tail wind
3	Driving down steep inclines
4	Driving down very steep inclines

4.7. Change display

The display in the bottom row of the display changes each time the ⟳ button is pressed between:

- Trip mileage DIST in km (miles)
- Overall mileage ODO in km (miles)
- Ride time CHRONO in hours and minutes
- Average speed AVSPD in km/h (mph)
- Time CLOCK in hours and minutes
- Motor temperature MOTOR TEMP in °C

The tachometer displays the current speed in km/h (mph).

A long press on the ⟳ button can reset the trip mileage DIST, ride time CHRONO and the average speed AVSPD.

4.8. Check the charge status of the battery

While the system is switched on, the battery symbol in the charge indicator shows the remaining life of the battery.

When all batteries are visible the battery is 100 % charged.

Alternatively, the charge status of the battery can be shown on the LED ring of the charge socket. Slowly slide the finger across the charge socket and see the LED ring light up a particular colour.

Colour of the LED ring	Charge status
Green	100 – 85 %
Orange	85 – 25 %
Red	< 25 %

4.9. Set the time

While the system is switched on, press the ⏻ and ⟳ button at the same time.

CLOCK and the current time setting will be displayed and the hours indicator will flash.
Use the + - or the — button to adjust the hours. Use the ⟳ button to switch between hours and minutes. After adjustment is complete, complete your entry with the ⏻ button. The time is saved.

4.10. Lights

The lighting system consists of:

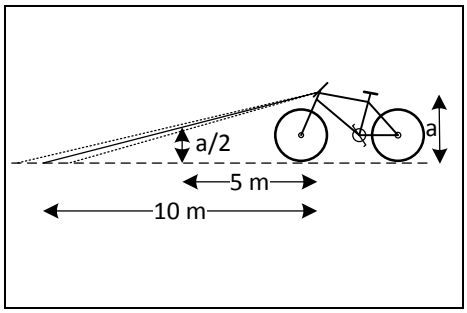
- Headlight and rear light
- white reflector in the headlight
- red reflector on the saddle
- reflective strips on the tyre walls
- yellow reflectors on the pedals
- two yellow side reflectors (S-Pedelec only)

Regularly check the safety-technical equipment and, where necessary, repair it in an authorised workshop.

The lighting system meets the requirements of the StVZO. This registration is issued by the Federal Motor Transport Authority and can be seen by a registration number with a shaft line, the upper case K and a number.

A precise lens system scatters light of a high-performance LED evenly on the road surface. This produces a high light intensity thus increasing safety.

The headlamp range must be adjusted according to local national regulations. The adjacent figure shows the requirements as applicable for Germany for example. The headlight must be adjusted so that the light cone hits the ground after 10 m, or at distance of 5 m (16.4 ft) is only half as high as when it was emitted. On the GRACE EASY this is 40 cm (1.3 ft).



Park the bike on an even surface.

Undo the screw underneath the headlight with a fork socket SW 10 (0.39 in) and tilt it accordingly.

The indicated clearances and distances are examples. When setting the headlamp range, follow the regulations in your country.

Pressing the ⏻ button for a long time on the display unit switches on both the headlight and the rear light and the background lighting of the display.

Do not ride the bike without a battery or display unit. The lighting system does not work when the battery or display unit is not fitted. Driving without a functioning lighting system may be prohibited in some countries.

We recommend you always drive with the light on to make you safer. The lighting system consumes relatively little energy and has hardly any influence on the range of your GRACE EASY.

4.11. Belt drive

The GRACE EASY is fitted with an innovative drive belt reinforced with carbon fibre. When installed properly, the Gates carbon drive is almost completely maintenance-free - it requires no lubrication or re-tightening.

The carbon fibres in the belt can absorb high tensile forces but are sensitive to bending loads, notching, shear forces, and blows. Even if the carbon fibres of the belt are enclosed, you need to take very special care when handling the carbon drive.

Improper handling causes damage to the carbon fibres inside the drive belt. A drive belt which was previously damaged in such a way can tear suddenly and without warning while you are riding.

Incorrect assembly or improper handling can lead to damage to the drive belt which cannot be seen from the outside, e.g. by bending or twisting it. A drive belt damaged in such a way can tear unexpectedly. Risk of accident and injury!

- Handle the drive belt with the utmost care and pay attention to the handling instructions.
- Have a damaged drive belt replaced immediately by a specialist workshop.

When handling the drive belt, avoid the following:

- bending it in any direction
- twisting it
- turning it upside down
- bending it against its curvature
- bundling it or tying it together with cable ties or cord
- using it as a tool
- the assembly of the drive belt under tension with a lever or by rotating the pedal crank

The sprockets may freeze up when riding over ice and snow or in loamy mud. This can cause the drive belt to skip or leave the sprocket thus damaging it. A drive belt damaged in such a way can suddenly tear causing you to slip off the pedals, Risk of accident and injury!

4.12. Gear change

A gearbox with 3 gears is fitted into the drive on the GRACE EASY. You switch gears using the shifter on the handlebars. You can see the gear you are currently in (in red) from the gear indicator on the shifter.

The gear can be changed while the bike is stationary or in motion. It is easiest to change gears while riding when applying low pedal force.

4.13. Braking

The GRACE EASY is fitted with hydraulic disc brakes which bring the bike to a halt quickly and safely. Disc brakes respond more quickly than rim brakes, especially in the wet.

A hydraulic disc brake generates a high braking force even with a small handforce. To distribute the braking force to both wheels, use both brakes at the same time. The pedal power assistance provided by the electric motor is interrupted by braking with the front wheel brake (or if you stop pedalling).

A sensor is built into the brake lever for the front wheel brake which switches the electric motor to energy recuperation mode during braking. As a result, the electric motor always applies the brakes to the rear wheel at the same time, even when the generator mode is switched off. The braking force applied to the rear wheel depends on the speed and cannot be adjusted. Exception: The rear wheel does not brake when the battery is fully charged.

The friction between tyres and the road surface is reduced on wet roads. In addition, water between the brake pads and -discs reduces the effectiveness of the brakes. The braking distance increases. Risk of accident!

The rear wheel may lift off the ground when applying the front wheel brake strongly. This can cause you to go over the handlebars. Risk of accident!

Always brake the bike by pressing the front and read wheel brake at the same time and when applying the brakes strongly, shift your centre of gravity towards the back of the bike.

During braking, the electric motor acts as a generator (generator mode). The electrical energy thus produced is fed back into the battery. At the same time, you brake the GRACE EASY without wear as a result of the energy recuperation process.

Note that GRACE EASY does not have a back-pedal brake. If you are not familiar with the braking force of hydraulic disk brakes, first make some test brakes on stable ground away from main roads.

Avoid the continuous application of the brakes. On longer stretches downhill, brake using both brakes short but forcefully. Releasing the brakes in between allows them to cool off. Stop at the first signs of the brakes overheating.

Symptoms which may point to overheating:

- increased handforce
- Smell
- loud grinding noises

Allow the brakes to cool down before you continue your journey.

4.14. Tyres and wheels

The tyres are the contact point between the wheels and the road. They provide grip and traction and absorb small bumps, depending on the pressure in the tyres.

The tyres which come as standard on the GRACE EASY are specially designed for Pedelecs. Using other tyres may lead to increased friction and a shorter range. They may also have a negative effect in the response, susceptibility to punctures, and noise.

Therefore, when replacing tyres make sure the new tyre has the same type, dimensions and tread pattern.

The GRACE EASY comes with the following tyres as standard:

CONTINENTAL EcoContact 28 x 1.6

The recommended operating pressure for these tyres is a max. 6 bar (max 85 psi).

These tyres which are fitted as standard are directional. An arrow on the tyre wall indicates the direction of travel.

Regularly check the tyre pressure (at least every 14 days). Note that warn tyres always have a higher tyre pressure than cold ones. The tyre inflation pressure changes by approx. 0.1 bar (1.45 psi) for each 10 °C (50 °F) change in air temperature.

Since puncture protection is built into the tyres on the GRACE EASY, you are not able to check the pressure of the tyres by pressing on the tyres with your thumb. Always use a suitable measuring device for the tyre pressure, e.g. a floor pump with tyre pressure indicator.

Use a new inner tube after a puncture. This gives you the best possible concentricity of the wheels.

The reflecting strips on the tyre walls replace the spoke reflectors in accordance with the legal requirements.

The rims on the GRACE EASY are designed for tubes with Sclaverand valves. To inflate the tyres, remove the cap and initially undo the knurled nut.

The wheels on the GRACE EASY have been manufactured carefully and come centrally aligned. Nevertheless, the spokes may shift during the first few kilometres. For this reason, regularly check the tension on the spokes and have the wheel re-centred by a specialist dealer if necessary.

4.15. Side-/double-kick stand

Depending on the model variant, the GRACE EASY has a double kick- or side stand. Lift up the rear wheel of your GRACE EASY from the floor a little before extending/retracting the double-kick stand.

Parking the bike on a downwards slope or pliant surface can cause it to fall over and get damaged. Place it on a level floor which can support its weight as best as possible. On upwards or downwards slopes, always set it down in the line of slope, with the front wheel pointing towards the highest point.

Neither the double kick- or side stand are designed to support the weight of one person. Do not sit on the bike while the side/double kick stand is extended.

4.16. Luggage rack (optional accessory)

A loaded luggage rack changes the way the bike handles. It has a negative effect on the steering- and braking properties, in particular. The braking distance may increase. Risk of accident!

Do not exceed the maximum load capacity of the luggage rack (see the information on the luggage rack).

When transporting items, make sure that the rear light and reflectors on the tyre walls can be easily seen by other road users.

Do not use a loose strap to secure the items being transported as the hanging ends of the straps can get caught up in the rear wheel.

4.17. Suspension forks Rock Shox Recon 29'' (optional accessory)

The Rock Shox Recon 29'' suspension fork reliably provides the necessary traction and control on difficult road surfaces.

A lockout function disables the fork's suspension function to allow you to pedal efficiently on a level road surface. To enable it, turn the setting head "lockout" on the fork crown to the right as far as it goes. To prevent damage to the suspension fork, only use the lockout function on a level surface.

The stiffness of the suspension can be adjusted using the valve on the left side of the fork crown in order to adjust the fork to the driver's weight using a standard fork pump. If you sit on the bike when stationary, the suspension fork should spring up by approx. 20 % of the entire spring travel.

The right-hand fork has a knob which can be used to adjust the speed with which the fork springs down. When riding over an obstacle, the suspension fork should spring down quickly, however it should also not oscillate more than once.

Stop using the bike if parts of the fork are bent or broken, oil is leaking, if there are noises which suggest an excessive bottoming or if there are other signs of a possible failure of the fork, such as e.g. a reduction in shock absorbance. In such cases, immediately take the bike to a specialist dealer for inspection and repair. If the fork has a fault, this can lead to damage to the bike or injury to the rider.

If the bike with the dropouts (front wheel removed) is attached to a carrier, e.g. for transportation purposes, do not tilt it to one side. if the bike is tilted while the dropouts are clamped to the transport carrier, the forks may rupture. Make sure that the fork dropouts are correctly secured with a quick release, as shown in the operating manual for the bike carrier.

When using a bike carrier to which the fork dropouts are secured, you must also secure the rear wheel. If you do not secure the rear wheel, the weight of the vehicle can apply to one side of the fork dropouts causing them to rupture or break apart. If the bike falls over or falls out of the carrier, do not ride it again until the forks have been inspected for possible damage by a specialist. If you suspect damage, take the forks to a specialist dealer for inspection or get in touch with the Rock Shok fork manufacturer directly. You can find a list of international dealers at www.sram.com. Faults in the fork legs or dropouts can cause the rider to lose control of the bike and suffer serious and/or life-threatening injuries.

5. Maintenance

5.1. Regular maintenance work

Before each ride:

- Check the wheels and tyres
- Check the drive belt
- Check the battery fitting
- Check the function and wear of the brake system
- Check screw connections

Every 300 – 500 km (186 – 310 miles):

- Check the drive belt for wear and check the tension/travel is correct
- Remove any dirt from the drive belt and timing pulleys
- Check that the screw connections sit tightly
- Measure the wear surface of the brake discs

1 x year/after 1000 km (621 miles), afterwards every 2000 km (1242 miles), by a specialist dealer:

- Check the forks bearing, replace where necessary
- Check the wheel hubs, replace where necessary
- Check the pedals, replace where necessary
- Check the drive belt, replace where necessary
- Check the shift cable, replace where necessary
- Check the tightening torques on all screw connections
- Adjust the gear switching, check the forks bearing and brakes
- Make sure the drive belt is tensioned correctly, check for wear
- Check the wheels and tyres
- Check the stem and handlebars and heavily used parts for wear

5.2. Removing/installing the front wheel

The hydraulic disc brakes must not be operated while the wheel is disassembled. The brake pistons come together completely. Immediately after removing the wheel, place the yellow transportation safety between the brake pads.

Removal:

Undo the axle bolt with a hexagon socket SW5 (0.2 in). Remove the front wheel from the fork and slide the transport safety between the brake pads.

Installing:

Remove the transport safety from the brake pads and carefully position the front wheel into the dropouts of the fork. Make sure that the brake disc slides between the brake pads. The axle on the front wheel must sit evenly in the two dropouts. Tighten the axle with a hexagon socket SW4 (0.16 in) (see torque table).

5.3. Removing/installing the rear wheel

When working on the drive system and rear wheel, always remove the battery from the frame first.

The hydraulic disc brakes must not be operated while the wheel is disassembled. The brake pistons come together completely. Immediately after removing the wheel, place the yellow transportation safety between the brake pads.

Please follow the instructions on working with the drive belt in the chapter "Belt drive"

Removal:

Shift the gears into first gear and undo the shift cable from the rear wheel hub. To do so, press the locking mechanism on the plastic sleeve on the right dropout.

Disconnect the plug connections for the data cable and power cable on the left dropout.

Undo the axle nuts with a hexagon socket SW15 (0.59 in). You can now remove the rear wheel.

Carefully remove the frame from the rear belt pulley and insert the transport safety between the break pads.

Installing:

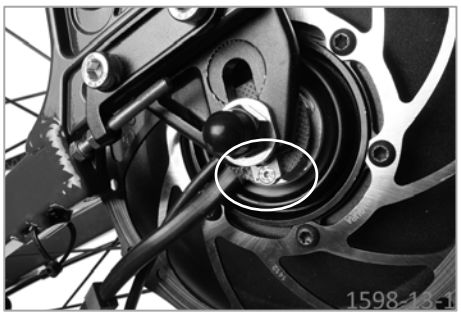
First of all, remove the transport safety from the brake pads.

Place the belt on the rear belt pulley and carefully place the rear wheel into the dropouts. The rear wheel must be positioned so that the torque arm can slide into the left-hand dropout.

Make sure that the brake disc slides between the brake pads. The axle on the rear wheel must sit evenly in the two dropouts. The flanged lug of the disc on the right-hand side of the axle must protrude into the dropout.

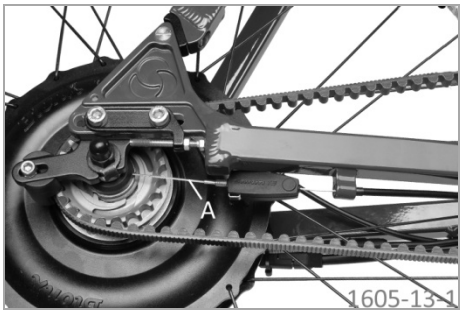
Firmly tighten the two axle nuts in sequence and alternately with a open end spanner SW15 (0,59 in) fest (see torque table).

Connect the plug connections on the power cable, data cable and shift cable and when necessary re-adjust the gears.



5.4. Adjusting the gears

Using the shifter, shift into third gear. In third gear, the gear cable A on the right dropout should not be able to be pulled out from the wheel hub any further. If this is not the case, this means the shift cable is too slack.



- If you cannot shift into third gear, turn the nuts on the gear shifter inwards (clockwise) as the shift cable is too taught. You can also pull the shift cable “A” on the right dropout out of the plastic sleeve of the shift cable a little ways.
- If you can still pull the shift cable “A” out further, turn the nuts on the gear shifter outwards (anti-clockwise). You can also move the plastic sleeve of the shift cable a little further on gear cable “A” on the right dropout.

After the adjustment, run through the gears several times for testing purposes.

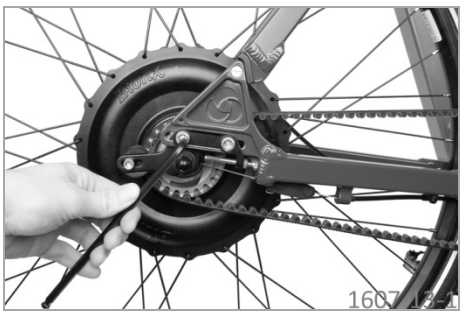
5.5. Tensioning and aligning the drive belt

If the tension on the drive belt is not set correctly, this can cause damage to the drive belt and other components.

If the tension of the drive belt is too low, the drive belt may slip on the timing pulley. This may cause damage to the carbon fibres inside the drive belt. If the drive belt has slipped, you must have it replaced by a specialist workshop.

If the tension on the drive belt is too high, this may cause damage to the bearings and seals in the wheel hub. This also increases the wear and frictional losses in the entire drive.

Undo the four hexagon sockets SW6 (0.24 in) right and left on the dropouts as well as the screw for the torque arm SW5 (0.2 in) above the left dropout.



Tighten the belt by tightening the setting screw on the dropouts which can be moved horizontally, with a hexagon socket SW4 (0.16 in) with spherical head. You can use the open end spanner SW10 (0.39 in) to lock the setting screw via a nut.

Press the belt in the middle between the front and rear pulley downwards on its upper side with a finger.

The belt is tensioned correctly when the belt can be pressed downwards by approx. 12 mm (0.47 in).

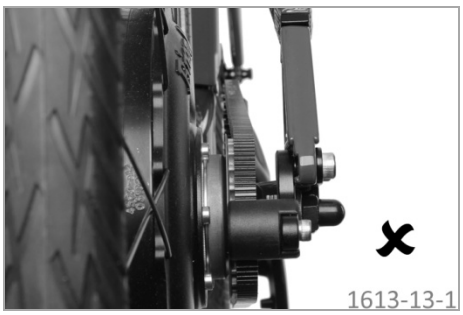
As the tension may vary slightly along the belt, this procedure should be performed while the belt moves further step by step.

Turn the pedal crank one turn and repeat the measurement. If the tension on the belt is too high or too low, repeat this procedure until the measurement result meets the requirements.

Turn the crank 10 – 15 times forwards and backwards and observe the line in which the belt travels. The belt should only touch the side stop (flanged wheel) on the rear timing pulley slightly or have a maximum gap of around 1 mm (0.04 in). The optimal situation is a constant distance of 0.5 mm (0.02 in).

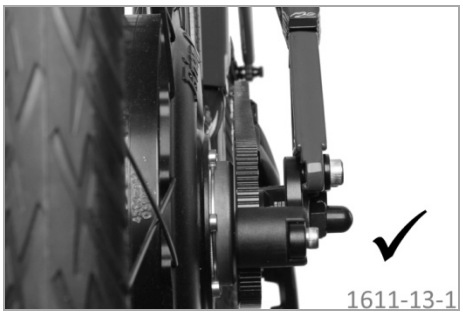
Wrong: The belt travels at an angle to the pulleys.

Tightening the axial adjustment bolt to the dropouts on the drive side or loosening it on the opposite side guides the belt travel back in the direction of the side stop (flanged wheel) on the rear pulley.



Correct: Both belt pulleys are aligned and the belt travels in a straight line.

Turn the crank again and check the line of the belt- adjust where necessary. Repeat this step until the line of the belt is correctly adjusted.



Firmly tighten the four hexagon sockets SW6 (0.24 in) right and left on the dropouts as well as the screw for the torque arm SW5 (0.2 in) (see the torque table).

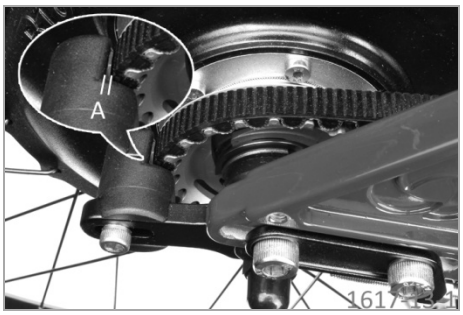
Align the rear wheel so that the belt travels in the correct line. Always make sure the belt tension is correct.

We recommend you have a specialist workshop inspect the tension of the drive belt.

5.6 Adjusting the belt guide

The belt guide prevents the drive belt jumping on the rear belt pulley or prevents it from being able to slip from the pulley.

The gap “A” between the belt guide and the back of the belt should lie between 1 - 1.5 mm (0.04 - 0.06 in).
To adjust the gap undo the screw with a hexagon socket SW5 (0.2 in) and move the belt guide in the elongated bore.
Tighten the screw again with a hexagon socket SW5 (0.2 in) (see torque table).



5.6. Assembling the pedals

Apply a think layer of grease to the threads on the pedal axis and crank.

First of all, screw the pedal loose by hand. Make sure the parts are positioned at the correct angle to each other and do not tilt.

Move the crank into a horizontal position so that the pedal is facing the front wheel.

Place the open end spanner SW15 (0,59 in) on the pedal axle and hold the crank firmly on the opposite side.

Tighten the pedal with the torque according to the data provided by the crank manufacturer.

The right pedal has a right-hand thread, the left pedal a left-hand thread to the pedal axle for assembly onto the cranks. The right pedal is screwed in a clockwise direction and the left pedal anti-clockwise.

5.7. Checking the wear on the brake pads

Brake discs, brake callipers, and quick-release clamps and axle nuts can become very hot after braking, especially on longer rides. Wait for these parts to cool down before touching them.

In the assembled state:

Pull the brake lever on the handlebars and insert the transport safety with the thick end between the lugs on the brake pad carrier.

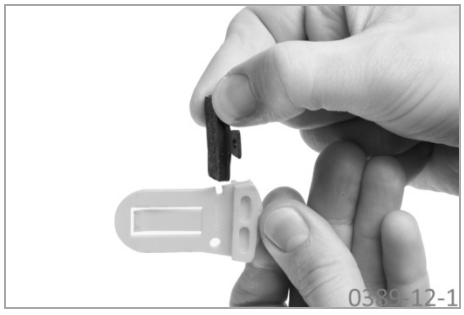
If the transport safety no longer fits between the lugs, this means the brake pads are worn and must be replaced.

In the disassembled state:

When the brake pad

- fits into the slit on the transport safety, or
- the total thickness of the brake pad including pad carrier, at the thinnest point, is less than 2.5 mm (01 in) thick,

the break pads are worn and must be replaced.



5.9. Replacing the brake pads

Never push the pistons back while the pads are disassembled as otherwise you may damage them.

This description applies for replacing brake pads on the front and rear wheels.

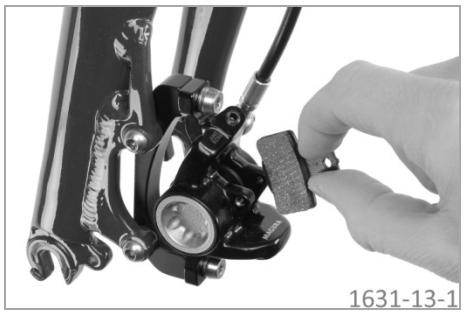
Remove the wheel as shown in the instructions.

Move back the pistons in the brake calliper while the brake pads are installed with the transport safety or using a wide screwdriver. Do not apply heavy force. Apply from different sides where necessary until the slave pistons slide back fully without needing to apply heavy force.

Twist the retaining screw on the brake pad out using the Torx T25 spanner.

Remove the brake pads upwards and out of the brake calliper.

Insert the brake pads into the brake calliper one by one. The brake pads must point inwards towards the brake disc. They are held into position by magnets.



The retaining screw on the brake pad is always fitted with a one-time action thread locking mechanism. If you use the screw more than once it may come undone while riding. This can cause the brakes to fail. Risk of accident!
Always replace the retaining screws with new ones immediately after they have come undone. Dispose of the used retaining screws immediately.

Turn the retaining screw on the brake pad into the brake calliper. make sure that they pass through the "ears" of the brake pad carrier, tighten them (see torque table).

Reassemble the wheel (see relevant instructions) Pull the brake lever several times until you feel a steady pressure point. Brake the new brake pads.

5.10. Checking the wear on the brake disc

Measure the thickness of the brake discs with a slide gauge.

The minimum thickness - 1.8 mm (0.07 in) - is printed on the brake discs. the value must not fall below this minimum on the entire friction ring. Should it do so, have the brake disk replaced immediately by a specialist workshop.

5.11. Replacing the bake disks

This description applies for replacing brake disks on the front and rear wheels.

Remove the wheel as shown in the instructions.

Remove the screws on the brake disk with a Torx T25 spanner and remove the brake disk from the wheel flange.

Insert the new brake disk with the lettering pointing outwards onto the wheel flange. Note the direction of travel of the brake disk. The arrow on the brake disk must face the direction of travel.

First of all, insert the new screws loosely using a Torx T25 spanner.

Turn the brake disk on the wheel flange downwards counter to the direction of travel.

Tighten the screws cross-ways (not all-round but opposite).

The screws to secure the brake disk have a one-time action thread locking mechanism. If you use the screws more than once they may come undone while riding. This can cause the brakes to fail. Risk of accident!

Always replace the retaining screws with new ones immediately after they have come undone. Dispose the used retaining screws immediately.

6. Transport

To prevent damage to your GRACE EASY during transport, please heed the following instructions:

- Before transporting on a car roof or tailgate carrier, do not remove firmly-fixed accessories such as the display unit.
- Slide the transport safeties into the brake callipers provided that you dismantle the wheels.

Transporting the GRACE EASY battery in a passenger aeroplane is not permitted.

Transporting the GRACE EASY with its battery installed on a car with a roof or tailgate carrier is not permitted. Remove the battery before transport.

The weight of the bike places special requirements on a car roof or tailgate support. Unsuitable vehicle supports can rupture while riding or may not be able to support the GRACE EASY reliably.

Only use suitable bike carriers for the transport. Take notice of the information given in the vehicle manual on roof loads and bearing loads as well as the instructions in the assembly/operating manual for the bike carrier.

7. Cleaning and maintenance

Do not use high-pressure cleaners to clean the GRACE EASY. The strong water jet from a high-pressure cleaner can cause damage to tyres, drive belts, bearings or electric components which are not visible externally. Components damaged in such a way may fail unexpectedly. Risk of accident!

In particular, take the following instructions into account when maintaining your GRACE EASY:

- Use as little water as possible and keep it away from electrical contacts.
- Clean the vehicle with a soft sponge or soft brush.
- Clean the battery carrier on the down tube with a damp cloth.
- Allow the electrical plug connections to dry before putting the bike back into operation.

8. Troubleshooting

Problem	Possible causes and remedies
The drive system does not switch on.	➢ The battery does not have sufficient charge. Check the charge status of the battery and where necessary charge the battery. ➢ The battery does not fit properly in the frame. Remove the battery and re-insert it. The lock cylinder must be fully latched. ➢ The display unit is not latched/electrical connections have come lose. Check the fit of electrical connections on the handlebars and motor. If the problem is not resolved with these measures, seek out a specialist dealer.
The drive system does switch one but the electric motor does not provide any assistance,	➢ The electrical connections on the handlebars or in the proximity of the motor are not inserted correctly or have come undone. Check the electrical connections on the handlebars and motor. If the problem is not resolved with these measures, refer to a specialist dealer.

The charge level indicator on the display unit does not display "full" after a complete charge.	➢ The battery is affected by the ambient temperatures so that the battery becomes too hot while being charged. Allow the battery to cool down and repeat the charge procedure. Also observe the additional instructions on charging the battery.
The charge level indicator on the display unit does not indicate the charge level reliably.	➢ By discharging and charging the battery frequently, the synchronisation between the charge level indicator and the actual charge level of the battery cannot be calibrated. After approximately every 30 cycles, perform a full discharge.
The display unit displays an error code.	➢ A fault has occurred in the drive system. Jot down or remember the error code and refer to a specialist workshop. The error code makes it easier to locate and fix the fault.
The system is permanently in generator mode.	➢ The brake sensor in the brake lever for the front wheel brake does not respond. Switch the drive system off and on again. If this does not help, disconnect the connecting cable from the brake lever to the operating console at the electrical connection. Have a specialist dealer inspect the drive system right away.
The lighting system does not work.	➢ The battery does not have sufficient charge. Check the charge status of the battery and where necessary charge the battery. ➢ Electrical connections can come loose. Check the fit of electrical connections on the handlebars. If the problem is not resolved with these measures, refer to a specialist dealer.

The drive system switches itself on after the battery has charged on the bike.	➢ The mains plug is disconnected from the socket but the battery charger is still connected to the battery. The system will switch itself on as a result. Always after charging, first unplug the plug on the charger from the battery and only then unplug the mains plug from the socket.
Poor braking performance.	➢ The brake is not run in. New brake pads must be run in until they reach their optimal braking performance. Accelerate the bike approx. 30-50 times to around 30 km/h (19 mph) and brake until the bike comes to a stop. If the necessary handforce stops falling to brake, the run-in procedure is closed. ➢ The brake disks or brake pads are oily. Clean the brake disks with alcohol and replace the brake pads. Have a specialist workshop fix the cause of the oily brake disks and -pads.

Oily brake disks or -pads can increase the braking distance considerably. Risk of accident and injury. Do not ride with oily brake disks or -pads. Refer to a specialist workshop right away.

Poor braking performance, undefined pressure point.	➢ There is air in the braking system and/or the system has a leak. Have a specialist workshop vent the braking system.

Air in the braking system and a loss of pressure caused by leaks can increase the braking distance considerably. Risk of accident and injury. Do not ride if there is air in the braking system. Refer to a specialist workshop right away.

Grinding noises coming from the brake while riding.	➢ There is dirt on the brake disk or brake pads. Brake several times to remove dirt from the brake disks and -pads. ➢ The brake calliper is not aligned up with the brake callipers exactly. Have a specialist workshop align up the brake calliper correctly.
Squeaky brakes when braking.	➢ The brake calliper is not aligned up with the brake callipers exactly. Have a specialist workshop align up the brake calliper correctly. ➢ The spoke tension on a wheel is not sufficient. Have a specialist workshop increase the spoke tension. ➢ The wheel is not secured properly. Tighten the axle bolt on the front wheel or the axle nuts and screws on the dropouts on the rear wheel to the specified torque.
Brake makes metallic noises and brakes very harshly.	➢ The brake pads have worn below the minimum level causing the brake pad carriers to grind against the disk brake. Have a specialist workshop replace the brake pads and, where necessary, the brake disks right away.

Worn brake pads can increase the braking distance. Risk of accident!

The front- or rear wheel cannot be fitted.	➢ The gap remaining between the brake pads is narrower than the thickness of the brake disk. Carefully press apart the brake pads with the yellow transport safety. When the wheel is not installed, always clamp the yellow transport safety between the brake pads.

The gears cannot shift into first gear.	➢ The shift cable is too slack. Increase the tension of the shift cable on the shifter. If the problem is not resolved with these measures, refer to a specialist dealer.
The gears shift from second to first gear by themselves.	➢ The shift cable is too slack. Increase the tension of the shift cable on the shifter. If the problem is not resolved with these measures, refer to a specialist dealer.
The gears cannot shift into third gear.	➢ The shift cable is too taught. Reduce the tension of the shift cable on the shifter. If the problem is not resolved with these measures, refer to a specialist dealer.

9. Wear parts

Some parts and components on your GRACE EASY are subject to function-related wear. For this reason, such parts need to be monitored very closely and regularly maintained or replaced.

The wear parts include:

9.1. Tyres

Tyres wear according to how the GRACE EASY is used and can vary considerably from one rider to the next. Heavy braking which causes the wheel to lock up reduces the service life of the tyre considerably. The tyre pressure should be checked regularly and the tyres must be inflated to the value indicated by the tyre manufacturer.

9.2. Handlebar grips

Handlebar and grip surfaces are subject to function-related wear and may need to be replaced at regular intervals. The grips must always be firmly attached to the handlebars.

9.3. Brake pads

The brake pads are subject to function-related wear which is heavily dependent on how the GRACE EASY is used. When riding along tracks with heavy drops or when using it for bike sports, it may be necessary to replace the brake pads at shorter intervals. It is therefore essential that you check the wear on your brake pads regularly. When necessary, have them replaced by a specialist dealer.

9.4. Belt

Always replace the Gates carbon drive belt when damaged due to improper handling or serious external influences. For instance, when a stone, twig or piece of clothing is caught in the belt and drawn between the belt and the belt pulleys. This kind of external influence can cause damage to the sensitive carbon fibres inside the belt even if there does not appear to be any damage to the belt on the outside. If you suspect the belt may be damaged, replace it as a preventative measure against accident or injury.

9.5. Sprockets

The sprockets must be replaced if they are damaged by serious external influences. For instance, if you land hard with the front sprocket when riding over a rock or twig, it may bend, and in this case will need to be replaced. Stones which are drawn in and get in between the belt and sprockets can damage the teeth on the belt and may even damage or tear off some of them. The affected sprockets will need to be replaced in this case as well. Whether or not you will also need to have the belt replaced will depend on the criteria in the previous chapter "Belt". If there is wear on the drive and all components were in use for the same time, we generally recommend you replace all components even if only one of the components has reached its wear limit.

9.6. Shift cables

The Bowden cables on the gears must be regularly maintained and may need to be replaced. In particular, this can be case when GRACE EASY is often left outdoors and exposed to the elements.

9.7. Lubricants

Lubricants change their properties in time. For this reason you should regularly clean and re-lubricate all lube points to prevent increased wear on the affected parts and bearings.

9.8. Handlebars and seat post

Both the handlebars and the seat post are subject to strong dynamic loads while riding. Therefore, check them at regular intervals for externally visible damage, replace when necessary. We also recommend you replace these parts every two years with heavy use of the GRACE EASY.

9.9. Moving parts and bearings

All moving parts and bearings are subject to use-related wear. The degree of wear depends on how the bike is maintained, services and how it is used (distance, riding in rain, dirt, salt).

9.10. Frame paint and coating

The coatings on the parts of your GRACE EASY protects them from corrosion. Regularly check all paint surfaces for damage and touch up these surfaces right away. This also preserves the look of your bike.

10. Maintenance

When you bought your GRACE EASY your dealer provided you with a service manual. Please keep to the inspection intervals in the manual for your own safety and riding pleasure! (Appendix A)

We recommend your dealer performs an initial inspection after 100 kilometres. Spokes, brakes, gears and bearings may shift position in this run in phase due to the parts breaking in. Your GRACE dealer knows your bike very well and has the right tools to maintain your GRACE bike.

After a crash or an accident on your GRACE EASY, you must take your bike to a specialist dealer for a thorough inspection.

Damage caused by crashes or improper handling must only be fixed by your GRACE dealer!

The faulty parts, especially forks, handlebars, frame, handlebar stem , saddle post, pedals or crank arms must be replaced immediately due to the risk of rupture.

11. Disposal

Waste electrical devices and batteries should never be discarded with the household waste! They must be separated according to Guideline 2002/96 EC for waste electrical and electronic equipment and handed over to a professional collection point for environmentally friendly recycling.

Please take waste electrical equipment at a local collection point. Separate packaging materials by type and dispose of them according to local regulations. For details, please contact your local authority.

Never dispose of batteries with the household waste! According to the guideline 2006/66/EC you are required to remove batteries from the bike and to hand them over to your dealer, a municipal collection point or other shops which sell batteries.

12. Technical data

12.1. Motor

Continuous rated power, Pedelec EU	250 Watt
Continuous rated power, Pedelec USA	350 Watt
Continuous rated power, S-Pedelec	350 Watt
Maximum torque, Pedelec	35 Nm (25.81 lb·ft)
Maximum torque S-Pedelec	40 Nm (29.5 lb·ft)
Maximum assisted speed Pedelec EU	25 km/h (15.5 mph)
Maximum assisted speed Pedelec USA	32 km/h (20 mph)
Maximum assisted speed, S-Pedelec	41 km/h (25.5 mph)
Permissible operating temperature	-10 °C (14 °F) to 40 °C (104 °F)
Permissible storage temperature	-30 °C (-22 °F) to 60 °C (140 °F)

12.2. Battery

Battery voltage	48 V BionX LiMn 6.3 Ah / 48V (303 Wh)
Capacity	6.3 Ah
Time to charge	2 – 6 hrs.
Permissible operating temperature	-10 °C (14 °F) to 40 °C (104 °F)
Permissible storage temperature	-10 °C (14 °F) to 45 °C (113 °F)
Permissible ambient temperature for charging the battery	0 °C (32 °F) to 40 °C (104 °F)

12.3. Charger

Name	BionX Charger SA190B-24U, Part No. 01-4576
Input voltage	100 – 240 V
Frequency	50 – 60 Hz
Permissible operating temperature	-10 °C (14 °F) to 40 °C (104 °F)
Permissible storage temperature	-10 °C (14 °F) to 40 °C (104 °F)

12.4. Braking system

Brake pads	Magura MT model range
Front brake disk	Disk diameter: 180mm (7.09 in)
Rear brake disk	Disk diameter: 180mm (7.09 in) for BionX

12.5. Weights

The vehicle weight is indicated for the standard scope of supply. Accessories and special equipment increase the unladen weight and reduce the useful load.

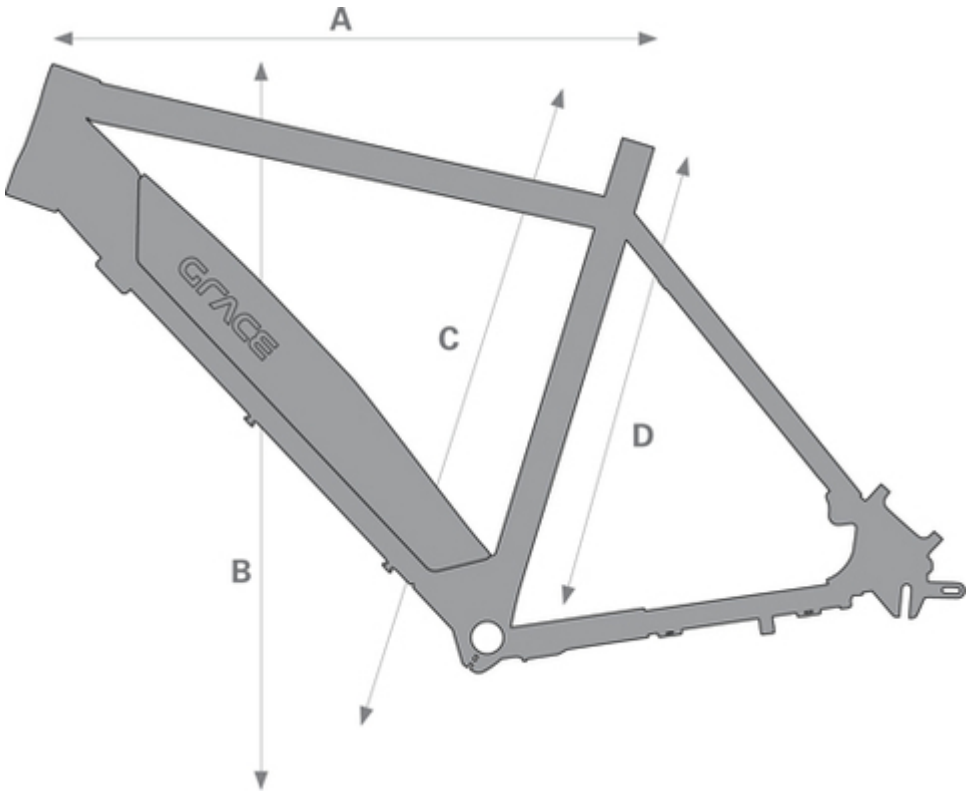
Vehicle weight	24.5 kg
Permissible total weight (bike with rider, accessories and luggage)	120 kg (264 lbs)

12.6. Add-on parts

Drive	Gates Carbon Drive 118T
Primary gear ratio, Pedelec EU	50 / 22, i = 2.27
Primary gear ratio, Pedelec US	50 / 20, i = 2.5
Primary gear ratio, S-Pedelec	60 / 22, i = 2.73
Range of gear ratios	186 %
Tyres	Continental EcoContact 28 x 1.6
Saddle post	Zoom
Handlebars	Zoom
Stem	Zoom
Saddle	DDK
Alloys	Ryde
Front wheel hub	Quanta
Pedals	Wellgo
Cranks	SR Suntour
Forks bearing	Cane Creek 10 series
Headlight	Busch & Müller
Side stands	Ursus
Double kick stand	Pletscher

12.7. Frame sizes

	A Top tube	B Standover height	C Inside leg measurement	D Seat tube height
GRACE EASY Size M	585 mm (23.03 in)	850 mm (33.46 in)	710 mm (27.95 in)	490 mm (19.29 in)
GRACE EASY Size L	610mm (24.04 in)	860 mm (33.86 in)	760 mm (29.92 in)	540 mm (21.26 in)



12.8. Tightening torques

If you tighten the nuts or bolts with the wrong torque,

- they may come undo if the torque is too low
- they may expand if the torque is too high causing them to break off

Excessive torque can also damage the parts. Risk of accident!

Always tighten the nuts and bolts to the prescribed torque. If you do not have a torque wrench, have the work carried out by a specialist workshop.

Front wheel axle	12 Nm (8.85 lb·ft)
Rear wheel axle nuts	40 Nm (29.5 lb·ft)
Adapter for mudguard	6 Nm (4.43 lb·ft)
Dropouts	16 Nm (11.8 lb·ft)
Mounting rail, battery on frame	6 Nm (4.43 lb·ft)
Screw fitting for brake pads	2.5 Nm (1.84 lb·ft)
Brake grip mounting	3 Nm (2.21 lb·ft)
Torque arm on left dropout	10 Nm (7.37 lb·ft)
Brake callipers	6 Nm (4.43 lb·ft)
Brake disks	4 Nm (2.95 lb·ft)
Internal bearing clamp	8 Nm (5.9 lb·ft)
Cable guides	2 Nm (1.48 lb·ft)
Crank on internal bearing shaft	34 - 44 Nm (25.08 - 32.45 lb·ft)
Pedals	20 Nm (14.75 lb·ft)
Belt guide	6 Nm (4.43 lb·ft)
Belt pulley on crank	4 Nm (2.95 lb·ft)
Saddle fixing	9 Nm (6.64 lb·ft)
Saddle clamp	6 Nm (4.43 lb·ft)
Shift grip on handlebars	4 Nm (2.95 lb·ft)
Stand plate on frame	40 Nm (29.5 lb·ft)
Stem forks	6 Nm (4.43 lb·ft)
Stem handlebars	6 Nm (4.43 lb·ft)
Frame opening on right dropout	8 Nm (5.9 lb·ft)

13. Warranty

A statutory warranty period of two years has been in effect since 01/01/2002. The warranty period begins when you receive your GRACE EASY from your dealer, who is your contact person for all warranty issues.

Please keep the invoice or till receipt in a safe place for the duration of the warranty period.

A warranty claim is valid under the following conditions:

- If there is a manufacturing or material defect, or misinformation,
- if the claimed damage already existed at the time of the handover,
- if the change to the product was not the result of function-related wear or ageing, and
- if the damage did not originally arise as the result of using the bike as intended,

The following is excluded from the warranty:

- All wear parts, according to the lost of wear parts under point Wear parts, maintenance, vehicle inspection after an accident unless production or manufacturing defects are involved;
- damage arising from the use of the bike in competition;
- damage arising through improper repair tools and inadequate maintenance;
- repairs which was the result of the use of used parts;
- damage which was the result of retrofitting non-standard equipment and technical modifications.

14. EC Declaration of Conformity

This declaration only concerns products in the condition they were placed on the market; parts added by the end user and/or post-purchase interventions are not considered. This declaration becomes invalid when the products are converted or modified without agreement.

Product name: EPAC/Pedelec (vehicle with electric motor as auxiliary drive)
Commercial name: GRACE EASY

Type: MGE-022 year of manufacture: 2013

The designated product meets the requirements of the Guidelines (including amendments, where applicable):

- EU Machinery Directive 2006/42/EC incl. EN 15194:2009 + A1:2011 + IEC 62133:2002
- EU Directive on Electromagnetic compatibility 2004/108/EC including EN 15194:2009 + A1:2011

Name/address of the manufacturer: GRACE GmbH & Co. KG, Wehrmühlenweg 8,
16359 Biesenthal, Deutschland

Product name: Charger for charging electro-chemical energy storage devices
Commercial name: BionX drive charger

Type: SA190B-24U Item number: 01-3635

The designated product meets the requirements of the Guidelines (including amendments, where applicable):

- EU Low Voltage Directive 2006/95/EC incl. EN 60335-1 / -2-29
- EU Directive on Electromagnetic compatibility 2004/108/EC with applicable EN standards:
  EN 15194:2009 + A1:2011 point 4.2.5.3
  EN 55014-2: 1997 + A2:2008
  EN 61204-3: 2000

Authorized person: Karl-Heinz Nicolai; Wehrmühlenweg 8; 16359 Biesenthal

Biesenthal, 11.01.2013

CEO: Karl-Heinz Nicolai